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ABSTRACT

This report documents the statistical evidence concerning the validity of teacher and parent ratings on The Five P's (Parent/Professional Preschool Performance Profile). Data from 2 studies were obtained from 55 disabled children at the Variety Preschooler's Workshop during 1988-89 and from 370 disabled children at 9 schools across the country during 1986-88. Comparison of scores on The Five P's with scores on other standardized tests in the first study showed parent validity coefficients for developmental skills on the five major domains in the .54 to .72 range and teacher validity coefficients in the .48 to .74 range. The second study found that factor analysis for both teachers and parents indicates that the Developmental Skills are a different construct from the Interfering Behaviors, confirming that the Interfering Behaviors are "unique" and apart from normal developmental skills. The scales generally clustered together in the way The Five P's was theoretically organized when it was conceptualized. Tables detailing findings are appended. (Thirteen references) (Author/DB)

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VALIDATION STUDIES OF THE FIVE P'S
Parent/Professional Preschool Performance Profile

by

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VALIDATION STUDIES OF THE FIVE P's

Abstract

This research report documents the statistical evidence concerning the validity of teacher and parent ratings on The Five P's (Parent/ Professional Preschool Performance Profile) by Judith Simon Bloch. The first set of data was generated from a study done at Variety Pre-Schooler's Workshop (VPSW) during the 1988/89 school year.

The second set of data was from national studies of children in 9 schools across the country (USA) during school years 86-88. The VPSW study was a "concurrent" validation study where scores from teachers and parents on The Five P's were compared with scores that psychologists produced on other standardized tests (the Vineland Adaptive Behavior Scales, the McCarthy Scales of Children's Abilities, the Bayley Scales of Infant Development and the Burks' Behavior Rating Scales). A total of fifty-five children were the focus of this study. The results of this study are described for both teachers and parents. Teacher validity coefficients for the developmental skills on the five major domains ranged from +.48 to +.74. Parent validity coefficients for the developmental skills on the five major domains ranged from +.54 to +.72. The data from both the teachers and the parents were well within the accepted professional ranges found in the literature. Evidence about the concurrent validity of the Interfering Behaviors suggested moderately strong evidence for both teachers and parents.

A second part of this validity report presents evidence from factor analyses of The Five P's which used data from a national replication study of 370 children. Several factor analyses are presented for both the teachers and parents. There is clear construct evidence that the developmental skills and the Interfering Behaviors are distinct from each other. The scales generally cluster together in the way The Five P's was theoretically organized when it was conceptualized.

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VALIDATION STUDIES OF THE FIVE P's

Section 1 - Background Information

The first set of validation studies on The Five P's was completed at Variety Pre-Schooler's Workshop (VPSW) in the 1982-83 school year. Children were randomly selected from the school and several scales which were similar to The Five P's were applied. In several cases, the scales were applied by the teachers who used The Five P's with the children, and at other times the school psychologist and the speech therapists applied other scales. The data which was collected was presented at the August 1983 Annual Convention of the American Psychological Association. That data was submitted to ERIC, and is is available from that source.

Shortly after that validation study, the scales on The Five P's were subjected to a rigorous item analysis. Approximately 40% of the items were changed, deleted, or replaced and some additional items were added to the scales. While the major structure of the scales did not change, it was understood that a second validation study would be needed.

VPSW received funding in 1986 for a national "Replication" study of the scales. This study was completed on a national sample of 370 children, from nine different schools in five geographic areas of our country. The data collected in this study allowed us to report test-retest reliability results as well as Cronbach's Alphas for both teachers and parents in that study.* In that national sample, 290 parents also rated their children. Norms for teachers and parents were established using this sample of teachers and parents.

*The Five P's Replication Study is available from Variety Pre-Schooler's Workshop.

That national sample of 370 children and 290 parents allowed us to "Factor Analyze" both the teacher ratings and the parent ratings on The Five P's. These results from that national sample are included in Section III of this report.

During the 1988-89 school year a study of the concurrent validity of teacher and parent ratings on The Five P's was carried out at Variety Pre-Schooler's Workshop. A total of fifty-five (55) children were included in the study, twenty-six children from the Fall of 1988 and an additional 29 children from the Spring of 1989. Those children were randomly selected from as many of the classes as possible. Parents were asked to give their permission for their children to be evaluated, and also to come to the school for interviews; and to cooperate in some of the testing.

Table 1 gives the age and sex grouping of the children in the national replication study of 1986-88 school years, and the validation study which was done at VPSW in the 1988/89 school year.

Table 1 - Age and Sex Distribution of Subjects in the National Replication Study, and the Validation Study at VPSW

	National Replication Sample			VPSW Validation Sample		
Age in Months	Total	Male	Female	Total	Male	Female
12 - 23	4	2	2			
24 - 35	25	16	9			
36 - 47	84	56	28	23	19	4
48 - 59	124	75	49	20	15	5
60 - 71	92	59	33	12	10	2
72 - 83	40	25	15			
84 - 89	1	1	0			
Totals	370	234	136	55	44	11

The demographic information on the national replication study (Hicks, Bloch, Friedman, 1988) is available from VPSW.

The Validation Study at VPSW included fifty-five (55) children ranging in age from 32 months to 74 months. The mean age was 52.8 months and there were 44 boys and 11 girls. Table A.1 in the Appendix presents the major disabilities of the children in both samples. As in the national replication study the official state classification given for funding is reported. Seventy-four and one-half percent (74.5%) of the population were labeled Speech Impaired. This corresponds closely to statistics from Mallory & Kerns (1988) that 70.5% of special needs children nationally between 3 and 5 years of age were classified as Speech Impaired.

The 55 children in the validation sample at VPSW represented a wide spectrum of socio-economic backgrounds. The income of the families varied widely from public assistance level to upper middle class. The majority of children were Caucasian (89.1%), with 3.6% Black, 3.6 % Hispanic and 1.8% Asian and East Indian. The boys were typically first or second in birth order of the children, while the girls spread more evenly through the first five children in the families. The sample represented a majority of intact families, but also included single parents, blended families, foster parents and adopted families.

The families came from a total of 36 different communities. Most of the parents had completed high school and a proportionate number had a college education. For the major part the mothers are the raters of The Five P's and also the parent interviewed by the psychologist in this study (approximately 72% and 78% respectively). Joint ratings by both the mothers and fathers on The Five P's were given 20% of the time and

10% of the time both parents were interviewed by the psychologists.

Nineteen (19) teachers took part in the validation study. Since the school is in New York State, sixteen had completed graduate training (a state certification requirement for permanent licensing). Fifteen (15) of the teachers were certified in Special Education. Most of the teachers had at least three years experience teaching in their present position. Four psychologists at VPSW worked in the validation study, being randomly assigned to cases. All were New York State Certified in School Psychology. Two had master's degrees and two had doctorate degrees. All had at least three years of experience.

Additional demographic data is found in Appendix 1.

Section II - Methodology of Validation Studies

This study was basically a "concurrent" validity study, where a score on The Five P's (a percentile score for the age of the child) is compared to a score on a similar test. Those scores should correlate, and typically the results of validation studies are within a range from +.50 to +.80. Lower than +.50 suggests a weak degree of similarity and above +.80 might suggest too much similarity. The scores from the "other" tests should have their own "validity", should be established instruments in the field. They are the benchmarks against which the scales of The Five P's are judged.

The process of finding "benchmarks" in our case was complicated by the fact that both the teacher and the parents use The Five P's independently. Thus, we needed external tests which allowed for both a rating by a teacher and also a rating by a parent. At the same time another professional assessor, the psychologist was included. The major "concurrent" test which we used was the new version of the Vineland Adaptive Behavior Scales. The Vineland Adaptive Behavior Scales have major domains which are similar to the Self Help, Motor Development, Language Development and Social Development scales from The Five P's. Also, the Vineland has forms for both parent and teacher ratings.

This selection allowed us to validate teacher ratings from a scale on The Five P's against a parent rating on a similar scale from the Vineland. It also allowed us to validate the parent ratings on The Five P's against a teacher rating on a similar scale from the Vineland. In the area of cognitive development, we validated both

teacher and parent ratings against a score which was produced by the direct testing of the child on the McCarthy Scales of Children's Abilities or the Bayley Scales of Infant Development by the agency psychologists.

To protect the testing from bias as much as possible, three psychologists took part in the study, and the tasks which were done by each psychologist varied randomly with the child. That is, one psychologist tested the child, a second psychologist interviewed the teacher, a third psychologist interviewed the parent/s. Each child's evaluation included reports from 3 psychologists. The sequence of psychologists varied with the children. The testing of the children by the psychologists, and the interviewing of the teachers and parents on the Vineland by the psychologists took place within a time period of six weeks prior to the application of The Five P's by the teachers and parents and six weeks after The Five P's had been completed.

The following procedures were used to study the degree of agreement between the teachers and the parents. The thirteen scales of The Five P's include two parts, a section of Developmental Skills, usually between 20 and 25 and a section of Interfering Behaviors, usually from 8 to 10 in number. By definition the developmental skills represent skills which all children should accomplish on a preschool level. Interfering behaviors are signs of problems in the development of a child, behaviors which "interfere" with normal growth patterns. All items are rated on a three part system: a score of "yes" means that these are consistently a part of the child's behavioral repertoire or skills, a score of "sometimes"

indicates that the behavior is seen at times but not consistently, and a score of "no" indicates that the child cannot do the skill or the behavior has not been observed.

The thirteen scales of The Five P's are clustered into five major domains, Self Help, Motor Development, Cognitive Development, Language Development, and Social Development. There is an additional scale, Classroom Adjustment, which is applied only by the teacher and not used by the parents. Self Help includes three scales: Toileting/Hygiene Skills, Mealtime Behaviors, and Dressing Skills. Motor Development includes two scales: Gross Motor and Fine Motor. Cognitive Development is one scale of nearly twice the length of the other scales. Language Development includes three scales: Communicative Competence, Receptive Language, and Expressive Language. Social Development includes three scales: Emerging Self, Relationships to Adults, and Relationships to Children.

For purposes of the statistical analysis of this report, scores were computed on each of the thirteen scales by assigning two points for a score of "yes", one point for a score of "sometimes" and no points for a score of "no". The statistical analyses which were done used the larger and more stable domains, that is Self Help, Motor Development, Cognitive Development, Language Development, and Social Development. Scores on each of these larger scales were constructed by adding the scores on the developmental skills to form a Developmental Skill Score. The scores on the interfering behaviors for all of the scales in each of the five larger domains were added to construct an Interfering Behavior Score. The same procedures were used in the factor analyses which are reported in the next section.

Section III - The Evidence on the Concurrent Validity of The Five P's

The analysis of the concurrent validity of teacher and parent ratings on The Five P's was split into two parts. The first analysis presents the data from the Developmental Skills Scores. The second analysis related to the Interfering Behavior Scores. These scores should be understood as representing two very different validity problems. The Developmental Skills Scores represent a level of child development and can fairly easily be compared with other scales which purport to measure those "standardized" constructs, such as motor or language development. To a very large extent, the scales on the Vineland and the developmental scales on The Five P's represent moderately similar constructs, that is Language Development on The Five P's should be very similar to Communication Skills on the Vineland. However, the Vineland does not have Interfering Behaviors, and the teacher and parent scales on the Vineland are not identical, as in The Five P's.

It should be mentioned again that every effort was made to control for biases in this study. One psychologist interviewed the parents using the Vineland and the Burks' Behavior Rating Scales. A second psychologist interviewed the teacher using the Vineland and the Burks' Behavior Rating Scales, and the third psychologist tested the child directly using the McCarthy or the Bayley. Teacher validation coefficients represent the correlation between the teacher ratings on The Five P's and the ratings which a psychologist reported from the Vineland or the Burks' after that psychologist had interviewed the parents. Similarly, parent validation coefficients represent the

correlation between the parent ratings on The Five P's and the ratings which a psychologist arrived at after applying the Vineland or the Burks' to the teacher.

The data which follows presents the results for the teachers and parents in Table 2. The number of children in each sample follows the Pearson Product Moment Correlation and is in parentheses.

Table 2 - Teacher and Parent Validity Correlations Between Scales on The Five P's and Selected Standardized Scales

	Validity Coefficients			
Scales on The Five P's	Teachers "R"	N	Parents "R"	N
Self Help SKills*	+.52	(53)	+.66	(50)
Motor Dev.	+.61	(53)	+.67	(48)
Language Dev.	+.59	(53)	+.72	(49)
Social Dev.	+.48	(55)	+.54	(49)
Cognitive Dev.	+.74	(55)	+.72	(49)

*There was no match for Classroom Adjustment, therefore it was not included. All correlations are significant at the .01 level.

Table 2, above, provides very good support for the claim that teachers and parents who use The Five P's do so with an acceptable degree of validity in their ratings. It is interesting to note that the highest correlations came from the area of cognitive development, the area in which the McCarthy and the Bayley were used and that those tests were administered directly to the child by the psychologists.

The level of validity coefficients for the parents is really remarkable. All of those correlations are above the +.50 criterion. It is also clear that the validity coefficients for the parents are stronger than the validity coefficients for teachers except in the

area of Cognitive Development. Again, parent ratings were validated against ratings by psychologists, either on the intelligence tests which were given directly to the child, or were validated against interviews of the teachers by psychologists on the Vineland. This part of the validity study presents very acceptable levels of standards of +.50 to +.80 in the literature.

Section IV - Evidence on the Validity of the Interfering Behaviors

The Interfering Behaviors Scores on the other hand represent different and more difficult scores to validate. These items represents habits or behaviors which impede growth and development. Not all children present all Interfering Behaviors, and children may exhibit Interfering Behaviors in one area and not in another. It is assumed that even non-handicapped children exhibit some Interfering Behaviors.

Consequently, it was assumed that the Interfering Behaviors cannot be expected to correlate with developmental scales. They should correlate with scales which measure problems or pathology. Thus, for the Interfering Behavior scores the assumption was made that they should correlate more strongly with scales like the Burks' Behavior Rating Scales since it measures problems or pathology in children. We did not assume that there was a direct correspondence between the Interfering Behaviors on The Five P's and any specific scale on the Burks', only that there should be a general correlation since the scales from the Burks' are not defined as "interfering behaviors". The scales on the Burks' represent problem behaviors and consequently, scores on the Interfering Behaviors of The Five P's should correlate positively with some of the scales from the Burks' Behavior Rating Scales.

Table 3 which follows presents selected significant and important correlations among the Interfering Behaviors as rated by the teachers and the relevant scales on the Burks' Behavior Rating Scales as rated by the parents in their interviews with the school psychologists.

Table 3 - Selected Significant Correlations for Teachers on the Interfering Behaviors on The Five P's Scales and Scales from the Burks' Behavior Rating Scales, N = 53

Scales from Burks B.R.S.	Interfering Behavior Scores from The Five P's: Self Help Sk.	Motor Develop.	Language Develop.	Social Develop.	Cognitive Develop.
3. Excessive Withdrawal	.41*		.49		.47
5. Poor Ego Strength				.43	
7. Poor Coordination		.35			
8. Poor Intellect					.40
9. Poor Attention	.43	.54		.53	.49
10. Poor Impulse Control		.51		.49	.39
11. Poor Reality Contact		.42		.33	.52
18. Poor Social Conformity				.36	

*All correlation coefficients which are reported above are significant at the .01 level.

There are some strong coefficients in the table above and those should be noted. The Interfering Behaviors correlated significantly in a number of cases. With an N of 50 a coefficient of +.25 is statistically above chance at the .05 level of significance. In most cases there are at least two strong correlations for each of the scales. Table 3 presents primarily the coefficients in the .30 to .50 range. It should also be remembered that the Burks' was not designed to measure "behaviors that may interfere with learning or development". Thus, we did not really expect the strength of agreement with the Interfering Behaviors that was found between the Developmental Skills at The Five P's and the Vineland or the McCarthy.

Special note should be made of the strong coefficients. Motor Development IB's on The Five P's correlated significantly with Poor Attention and Poor Impulse Control on the Burks'. The IB's of The Five P's Language Development scale correlated significantly with Excessive Withdrawal. The Social Development IB's on The Five P's correlated highly with both Poor Attention and Poor Impulse Control. The IB's from the Cognitive Development scale of The Five P's correlated highly with Poor Reality Contact, Poor Attention, and Excessive Withdrawal. The strongest evidence is clearly found in the areas of Motor Development, Social Development, and Cognitive Development.

The evidence about the validity coefficients of parent ratings on the Interfering Behaviors on The Five P's follows. It should be remembered that parent ratings on the IB's were correlated with teacher ratings of their children on the Burks'. Table 4 which follows presents the highly significant validity coefficients for the parent ratings on the Interfering Behaviors.

Table 4 - Selected Significant Correlations for Parents on the Interfering Behaviors on The Five P's and Scales from the Burks' Behavior Rating Scales, N = 50

Scale from Burks B.R.S.	Interfering Behavior Scores from The Five P's: Self Help Sk.	Motor Develop.	Language Develop.	Social Develop.	Cognitive Develop.
2. Excessive Anxiety	.40*			.41	
6. Poor Physical Strength		.49	.42		
7. Poor Coordination	.48	.49		.47	
8. Poor Intellect			.49		.52
9. Poor Attention		.50	.41	.43	.51
10. Poor Impulse Control	.41			.40	
14. Poor Anger Control				.44	
15. Excess. Sense of Persecution				.46	

*All correlation coefficients which are reported are significant at the .01 level.

Again, there are some strong coefficients which were found in this analysis. Parents' ratings on the IB's on the Self Help scale were highly correlated with the Poor Coordination scale of the Burks. In the case of the Motor Development scale, the IB's correlated highly with Poor Physical Strength, Poor Coordination, and Poor Attention. In the area of Language Development, parents' ratings on the IB's correlated highly with the Poor Intellect scale of the Burks'.

The IB's on the Social Development scale of The Five P's did correlate significantly with some of the Burks' scales as would be expected. Those scales were Excessive Anxiety, Poor Impulse Control, Poor Anger Control, and Excessive Sense of Persecution. Perhaps the strongest coefficients for the parents were in the area of the

Cognitive Development, Poor Intellect (+.52) and Poor Attention (+.51) and these certainly tend to validate that scale.

In summary, the attempt to validate the Interfering Behaviors on The Five P' s produced moderately good results. For the ratings of the teachers, very strong support was found for the items in the scale of Motor Development, Social Development, and Cognitive Development. In the case of Language Development and Self Help skills moderately strong support was found.

The evidence for the validity of parent ratings met the +.50 coefficient level for Motor Development and Cognitive Development, while Language Development presented one coefficient at the +.49 level. The areas of Self Help skills and Social Development are very close to that level (+.48 and +.47). Clearly, the Interfering Behaviors on The Five P's are not measuring the exact same constructs which are built into the scales of the Burks' Behavior Rating Scales. On the other hand, the fact that many of the coefficients were in the +.40 to +.55 range is very supportive of the validity of the Interfering Behaviors.

Section V -Evidence of the Construct Validity of The Five P's

Probably the most respected and most difficult to attain evidence that a scale has "validity" is the concept of construct validation. It focuses on the internal structure of a scale, and asks the question: What evidence is there that the scale really includes the parts that it says it does? If the scale is composed of items, like The Five P's, then it is assumed that the items cluster into scales. It is assumed that the "experts" who develop a scale initially understand the constructs that they wish to measure, and build into the scales a variety of items which represent those constructs. The Five P's has twelve scales which teachers and parents use and one additional scale of Classroom Adjustment which only teachers use. Those scales are clustered into five larger domains, Self Help, Motor Development, Language Development, Social Development, and Cognitive Development.

Those six larger domains represent general developmental concepts or "constructs". Social Development is supposed to measure aspects of that kind of growth in children, and not something else, such as age or intellectual development. In many cases those constructs are interrelated in children, such as motor development and intelligence, but for the major part we look for evidence that the scales stand moderately alone in a relative sense, and represent the concepts which the author/s built into the scale.

It should be noted that this kind of psychometric evidence is very difficult to obtain, and this kind of validity is not found very often even in the best of the standardized scales. Construct validity

is perhaps the best, most sought after, and most difficult to obtain. In many cases, the statistical technique which is called Factor Analysis is used to test for the "construct" validity of a scale. This is because factor analysis is designed to do just that, take a variety of scores and look at the internal structure or the ways in which those scores cluster. If the clusters which appear from the factor analysis are similar to the sub-scales which the author/s of a scale suggest are there, then the scale is said to have construct validity.

Factor Analysis is highly regarded partly because it requires a good amount of evidence (Harman, 1976; Nummally, 1978; and Gorsuch, 1983). There are some assumptions in factor analysis, that the sample of subjects is varied and represent as wide a sample as possible. Another assumption is that the sample size is large, usually a minimum of 10 to 20 cases for each variable in the analysis. Translated to the data from The Five P's, the twelve smaller scales, each containing sets of developmental skills and interfering behaviors yield a total of 24 variables for parents and 26 for teachers. Thus a factor analytic study of The Five P's would require a minimum of 260 cases. The assumptions would also be that the sample is varied, from as many sub-samples as possible. Since the recent Replication Study produced a total of 370 cases, from nine schools (excluding VPSW) from five distinct geographic areas of the country and that sample included 290 parent ratings and 370 teacher ratings, factor analysis was feasible and appropriate. It was considered that this large and diverse sample would allow for a factor analysis of the scale at this time.

In the specific case of The Five P's there are several factor analytic techniques which could be applied. There are two major kinds of items, Developmental Skills items and Interfering Behaviors. Since those are very different kinds of items they should "cluster" separately. That is, scores from the Developmental Skills items should cluster together and apart from scores from the Interfering Behaviors.

A second and third analysis is also relevant to the construct validity of The Five P's. The twelve scales are clustered into larger domains. The Self Help Scale contains Toileting/Hygiene, Mealtime Behaviors, and Dressing Scales. The Motor Development Scale contains Gross Motor and Fine Motor Scales. The Language Development Scale contains Communicative Competence, Receptive Language, and Expressive Language. The Social Development Scale contains Emerging Self, Relationships to Adults, and Relationships to Children Scales. Finally, the Cognitive Development Scale contains only one large scale of 41 developmental skills and 15 interfering behaviors. If the factor analysis clustered scales the way they were placed in the larger domains that would be very strong evidence of construct validity.

The following methods were used to set up the data so that those kinds of factor analytic studies could be done. The items within the Developmental Skills sections of each scale were added for a total score. The same thing was done for the items in the Interfering Behaviors section of each score. The general scoring system was used, that is a "yes" was given two points, and "sometimes" was given one point. Those total scores for the Developmental Skills and the Interfering Behaviors were compared for boys (234) and girls (136)

in the sample, and it was obvious that some differences between the groups existed. In addition, since the length of each scale varies, the range of total scores varied. To adjust for these differences, the scores were changed to "Z" scores, which in statistical studies is equivalent to the distance a score is from the mean, divided by the standard deviation of those scores. The value of "Z" scores is that they allow comparisons across non-equivalent scales, which is what was needed in the case of The Five P's.

Once the scores were changed to "Z" scores, factor analytic studies were done. In the computer analysis, two other conditions should be noted. The extraction process which was used was the Maximum Likelikhood method. This is suggested by Harmon (1976) and Gorsuch (1983) for two important reasons. The first is when a confirmatory analysis is being done rather than an exploratory analysis. We wanted to confirm the presence of the existing structure of the scales. Secondly, this technique is used when one wants an analysis which treats a sample of cases so as to closely approximate a "universe" of data. While we made every effort to assure diversity in our sample, and tried to collect data from various parts of the country, we had no assurances that our data really represented a universe of all handicapped children in the country. Thus, Maximum Likelihood extraction was applied to statistically adjust for this fact.

The second decision was to ask for a "Varimax" rotation of factors to produce the final solution. A Varimax rotation looks for the most independent solution, asking for factors which are as independent of each other as possible. This was important simply

because the scales on The Five P's are obviously interrelated. Cognitive development should theoretically be related to language development, etc. A Varimax rotation asks the analysis to find as independent a solution as possible.

For those readers who are not familiar with factor analysis, the tables which follow should be understood in this manner. The solutions which are found are usually presented in tables of a rotated factor matrix, which is a listing of "loadings" for each of the many variables on the factors which are produced. In most texts a loading of greater than .30 is considered important. Typically, a variable will load predominantly on one factor, and a cluster of variables are the equivalent to a "factor". In the analysis in Table 5.1, the Z scores on the twelve developmental skills and the twelve interfering behaviors scales are the "variables" which were factor analyzed. The way those variables "cluster" is an indication of the "structure" in the scale. The assumption is that the developmental skills should cluster together, and the interfering behaviors should cluster together. Table 5.1 presents that evidence for the ratings of teachers and Table 5.2 gives the evidence for the ratings of the parents.

Table 5.1 - Rotated Factor Loadings for Teachers, Maximum Likelihood Analysis Including Both Developmental Skills and Interfering Behaviors, N = 370

Scale from The Five P's	Factor 1	Factor 2	Factor 3
Dev. Sk. Dressing	**.905**	-.155	-.025
Dev. Sk. Emerg. Self	**.901**	-.210	-.188
Dev. Sk. Mealtime	**.895**	-.223	.041
Dev. Sk. Cognitive	**.891**	-.172	-.214
Dev. Sk. Rel. Adults	**.882**	-.212	-.111
Dev. Sk. Rel. Children	**.876**	-.224	-.097
Dev. Sk. Class. Adj.	**.865**	-.335	-.021
Dev. Sk. Toileting/Hyg.	**.865**	-.192	.021
Dev. Sk. Comm. Compet.	**.849**	-.084	-.317
Dev. Sk. Fine Motor	**.837**	-.176	-.125
Dev. Sk. Recept. Lang.	**.836**	-.072	-.296
Dev. Sk. Expressive Lang.	**.803**	-.051	-.293
Dev. Sk. Gross Motor	**.777**	-.076	-.032
I.B. Rel. to Adults	-.027	**.804**	.190
I.B. Emerging Self	-.141	**.766**	.180
I.B. Rel. to Children	.019	**.754**	.132
I.B. Classroom Ajd.	-.135	**.708**	.070
I.B. Fine Motor	-.135	**.660**	.139
I.B. Cognitive Skills	-.180	**.665**	.268
I.B. Mealtime Beh.	-.337	**.590**	-.065
I.B. Dressing Skills	-.240	**.555**	.053
I.B. Gross Motor	-.122	**.504**	.078
I.B. Toileting/Hyg.	-.267	**.438**	.094
I.B. Expressive Lang.	-.192	.200	**.610**
I.B. Receptive Lang.	-.362	.423	**.577**
I. B. Communicative Comp.	-.019	.395	**.571**

The first three major clusters of factors accounted for 64.7% of the Variance in the analysis. A Varimax Rotation was used. The scores were normalized by changing them into "Z" scores for boys and girls separately.

Table 5.2 - Rotated Factor Loadings for Parents, Maximum Likelihood Analysis Including Both Developmental Skills and Interfering Behaviors, N = 290

Scale from The Five P's	Factor 1	Factor 2	Factor 3	Factor 4
Dev. Sk. Emerg. Self	**.895**	-.216	.011	-.059
Dev. Sk. Cognitive	**.892**	-.109	-.108	-.089
Dev. Sk. Recept. Lang.	**.859**	-.143	-.048	-.016
Dev. Sk. Rel. Children	**.854**	-.179	.040	-.006
Dev. Sk. Toileting/Hyg.	**.848**	-.079	-.097	-.257
Dev. Sk. Express. Lang.	**.844**	-.060	.002	-.083
Dev. Sk. Comm. Compet.	**.840**	-.126	.044	-.100
Dev. Sk. Rel. Adults	**.831**	-.180	.079	.026
Dev. Sk. Mealtime Behavior	**.821**	-.099	-.156	-.233
Dev. Sk. Dressing Skills	**.818**	-.066	-.244	-.397
Dev. Sk. Fine Motor	**.785**	-.110	-.315	-.160
Dev. Sk. Gross Motor	**.759**	-.037	-.468	-.067
I.B. Rel. to Adults	-.036	**.794**	.044	.137
I.B. Rel. to Children	-.045	**.704**	-.048	.026
I.B. Emerging Self	-.136	**.702**	.119	.125
I.B. Receptive Lang.	-.265	**.640**	.143	.014
I.B. Communicative Comp.	.092	**.613**	.089	.014
I.B. Cognitive Skills	-.281	**.607**	.173	.121
I.B. Fine Motor	-.138	**.597**	.523	-.024
I.B. Expressive Lang.	-.106	**.490**	.146	.103
I.B. Dressing Skills	-.258	**.434**	.010	.400
I.B. Mealtime Behavior	-.281	**.391**	.104	.354
I.B. Gross Motor	-.101	.363	**.600**	.117
I.B. Toileting/Hyg.	-.239	.357	.095	**.403**

The first four major clusters of factors accounted for 64.9% of the variance in the analysis. A Varimax Rotation was used. The scores were normalized by changing them into "Z" scores for boys and girls separately.

It can be seen clearly from Table 5.1, that the analysis of teacher data presents very supportive evidence of scale structure. All of the Developmental Skills scores clustered together to form the first factor. In the case of the Interfering Behaviors, it can be seen that the factor was again a general factor of Interfering Behaviors, and that the Interfering Behaviors of the Language Development scale clustered together into the third factor. These results certainly give credence to the Developmental Skills scores being distinct from the Interfering Behaviors. It is notable that the Interfering Behaviors from the Language Development scale clustered together in a separate factor.

The data from Table 5.2 which gives the rotated factor loadings for the parent ratings are also supportive of scale constructs. All of the Developmental Skills cluster together to form factor 1. All of the Interfering Behaviors cluster together to form factor 2, except for those from the Gross Motor scale and the Toileting/Hygiene scale. This evidence suggests that the parents perceive those behaviors as distinct from the others.

In the next set of factor analyses, only the scores from the Developmental Skills items were analyzed. Again, the first analysis (Table 5.3) was done on the teacher ratings and the second (Table 5.4) was done on the ratings of the parents. The same concepts were being tested: did the cluster of scales approximate those built into the scale originally, using Maximum Likelihood Analysis and a Varimax Rotation for meaning?

Table 5.3 - Rotated Factor Loadings for Teachers, Maximum Likelihood Analysis Including Variables for the Thirteen Developmental Skills Scales, N = 370

Scale from The Five P's	Factor 1	Factor 2	Factor 3
Fine Motor	**.752**	.411	.365
Gross Motor	**.737**	.330	.281
Dressing Skills	**.733**	.348	.481
Mealtime Behaviors	**.631**	.389	.491
Toileting/Hygiene	**.598**	.338	.494
Expressive Language	.341	**.862**	.285
Receptive Language	.422	**.763**	.348
Communicative Comp.	.333	**.735**	.503
Cognitive Skills	.541	**.551**	.523
Relationships to Adults	.407	.394	**.744**
Relationships to Children	.440	.389	**.723**
Emerging Self	.398	.559	**.637**
Classroom Adjustment	.503	.378	**.613**

The first three major clusters of factors accounted for 86.6% of the Variance in the analysis. A Varimax Rotation was used. The scores were normalized by changing them into "Z" scores for boys and girls separately.

Again, the results of the above table are very supportive of scale structure. Clearly, the teachers cluster the thirteen scales into three large factors which account for 86.6% of the variance. The first factor is a combination of the Motor Scales and the Self Help Scales. The second large factor that was extracted is the Language Development Scales combined with the Cognitive Development Scale. The third large factor is the Social Development Scale plus the Classroom Adjustment Scale.

While the factor analysis did not extract the same five scale structure, it clearly did cluster the parts of the scales together. This clustering is logical. We know that Motor skills are related to Self Help skills; Language to Cognitive skills; Social Competence to Classroom Adjustment.

Table 5.4 - Rotated Factor Loadings for Parents, Maximum Likelihood Analysis Including Variables for the Twelve Developmental Skills Scales, N = 290

Scale from The Five P's	Factor 1	Factor 2	Factor 3	Factor 4
Expressive Language	**.795**	.390	.265	.195
Communicative Comp.	**.777**	.318	.359	.173
Receptive Language	**.733**	.412	.382	.144
Cognitive Skills	**.648**	.535	.387	.181
Emerging Self	**.582**	.414	.538	.264
Fine Motor	.406	**.765**	.291	.048
Dressing Skills	.371	**.724**	.314	.299
Gross Motor	.321	**.691**	.291	.164
Mealtime Behaviors	.333	**.609**	.410	.334
Relations/Adults	.372	.320	**.774**	.122
Relations/Children	.331	.448	**.612**	.235
Toileting/Hygiene	.384	.537	.407	**.543**

The first four major clusters of factors accounted for 83.7% of the Variance in the analysis. A Varimax Rotation was used. The scores were normalized by changing them into "Z" scores for boys and girls separately.

The factors which were produced for the parent ratings are a little different than those for the teachers, but there were some strong similarities. The first factor for the parent is a combination of the Language and Cognitive scales plus the Emerging Self scale from the Social Development scale (which is not included in the teacher structure). The second large factor includes the Motor Development scales plus two of the Self Help scales. It does not include Toileting/Hygiene as did the teacher equivalent of that cluster. The third factor combines Relationships to Adults and Relationships to Children, two of the three Social Development scales. Finally, the parents produce a fourth factor which is Toileting/Hygiene as a separate factor.

In many ways while the analyses of the Developmental Skills for the teachers and the parents did not extract exactly the five or six domains of The Five P's, the clusters are supportive. In the case of the teachers, it is very supportive that the scales retained their clustering even though the six scales clustered by pairs. For the parents and the teachers the language and cognitive scales clustered together. The motor scales clustered with the self help scales and two of the social scales clustered. Clearly the parents data are strong but not as supportive as the data from the teachers.

Table 5.5 which follows presents the data for the teachers on Interfering Behaviors. The first two factors which were extracted are the Social Development Scale and the Language Development Scale. The fourth factor includes two of the scales from the Self Help Scale. The fourth factor is the Motor Development Scale. The fifth and last factor is unclear, including the Classroom Adjustment Scale, the Cognitive Development Scale, and Mealtime Behaviors. While the third and the fifth factors do not fit the structure exactly, the first, second and fourth factor fully support the structure of the Interfering Behaviors as rated by the teachers.

Table 5.5 - Rotated Factor Loadings for Teachers, Maximum Likelihood Analysis Including Variables for the Interfering Behaviors, N = 370

Scale from The Five P's	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Relations/Adults	**.812**	.232	.257	.142	.184
Relations/Children	**.710**	.169	.246	.096	.196
Emerging Self	**.534**	.261	.244	.222	.421
Receptive Language	.176	**.725**	.197	.054	.327
Expressive Language	.061	**.679**	.157	.077	.025
Communicative Comp.	.335	**.577**	.045	.105	.094
Dressing Skills	.235	.160	**.624**	.116	.241
Toileting/Hygiene	.204	.166	**.606**	.103	.091
Gross Motor	.158	.114	.165	**.949**	.181
Fine Motor	.398	.215	.284	**.411**	.254
Classroom Adjustment	.428	.149	.222	.195	**.518**
Cognitive Skills	.341	.339	.235	.178	**.511**
Mealtime Behaviors	.172	.099	.465	.209	**.488**

The first five major clusters of factors accounted for 61.3% of the Variance in the analysis. A Varimax Rotation was used. The scores were normalized by changing them into "Z" scores for boys and girls separately.

Table 5.6 which follows presents the data on the factor analysis of the parents' ratings on the Interfering Behaviors. Some of the clusters are clearly understandable. Factor one represents the Social Development Scale plus the Communicative Competence Scale from the Language Development Scale. The concept of Communicative Competence is partly the social use of language, so that is not as surprising as it could seem. The second cluster or factor is the Self Help Scale. The third factor which is produced is that of Motor Development. The fourth factor which was extracted is that of Expressive Language, and the fifth is a combination of Receptive Language and Cognitive Skills.

Those last factors are mixtures or partial factors from The Five P's.

Table 5.6 - Rotated Factor Loadings for Parents, Maximum Likelihood Analysis Including Variables for the Interfering Behaviors, N = 290

Scale from The Five P's	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Relations/Adult	**.946**	.266	.113	.084	.036
Relations/Children	**.642**	.148	.027	.129	.218
Emerging Self	**.562**	.287	.256	.192	.141
Communicative Comp.	**.391**	.186	.147	.233	.242
Toileting/Hygiene	.182	**.665**	.125	.065	.014
Dressing Skills	.164	**.609**	.087	.214	.167
Mealtime Behaviors	.189	**.534**	.153	.051	.165
Gross Motor	.113	.235	**.957**	.085	.092
Fine Motor	.361	.188	**.465**	.268	.366
Expressive Language	.215	.182	.120	**.939**	.155
Receptive Language	.383	.304	.186	.353	**.452**
Cognitive Skills	.366	.396	.193	.194	**.446**

The first five major clusters of factors accounted for 61.9% of the Variance in the analysis. A Varimax Rotation was used. The scores were normalized by changing them into "Z" scores for boys and girls separately.

Section VI - Summary and Conclusions

This research report presents the information derived from two separate validity studies which took place from 1986 to 1989. The data which was presented on the concurrent validity of the teacher and parent ratings using The Five P's comes from a study at VPSW during the 1988-89 school year. Fifty-five children were in that study. For teachers, the concurrent validity coefficients for the Developmental Skills ranged from +.48 to +.74. For parents the concurrent validity coefficients for the Developmental Skills ranged from +.54 to +.72. The data from both the teachers and the parents are well within the accepted professional ranges cited in the literature. This data provides strong evidence about the concurrent validity of the major scales for both parents and teachers. Evidence about the concurrent validity of the Interfering Behaviors suggests moderately strong support for both teacher and parent judgments.

This study also presents some factor analytic evidence using data from a study which was done on a national sample which was collected from 1986 to 1988. The factor analysis for both the teachers and the parents suggest clearly that the Developmental Skills are a different construct from the Interfering Behaviors. This is important confirmation that the Interfering Behaviors are "unique" and apart from normal developmental skills. Factor analyses were also done on the Developmental Skills and the Interfering Behaviors separately. The results for both the teachers and the parents suggest logical clustering of the scales of The Five P's. Clearly, the clustering for the teachers is closer to the structure of The Five P's, but most of the parent

clusters are very logical as well.

These studies present the evidence to date about the "validity" of The Five P's. The data strongly supports the ratings of both the teachers and the parents. The data for the Developmental Skills for both the teachers and the parents is stronger than the data from the Interfering Behaviors. The evidence from the concurrent study clearly meets the accepted professional standards. The data from the construct study is related to several factor analyses. This will be repeated as our data base, becomes larger and more diverse.

Appendix

Table A.1 Distribution of Children in Samples from The Five P's National Replication Study and the VPSW Validation of The Five P's by Disability

Disability Category	National Replication Study Total	National Replication Study % of Total	VPSW Validity Study Total	VPSW Validity Study % of Total
Autistic	16	4.3	2	3.6
Emotionally Disturbed	8	2.2	5	9.1
Learning Disabled	3	.8	5	9.1
Mentally Retarded	21	5.7	1	1.8
Hard of Hearing	11	3.0	0	0.0
Speech Impaired	153	41.5	41	74.5
Visual Impairment	4	1.1	0	0.0
Orthopedically Impaired	22	6.0	0	0.0
Other Health Impaired	9	2.4	1	1.8
Multiply Handicapped	38	10.3	0	0.0
Attention Deficit Disorder	4	1.1	0	0.0
Conduct Behavior Disorder	2	.5	0	0.0
Pervasive Development Disord	1	.3	0	0.0
Downs Syndrome	6	1.6	0	0.0
Developmental Delay	60	16.3	0	0.0
Emotionally Disturbed/Abused	3	.8	0	0.0
No Data Given	9	2.2	0	0.0
Totals	370		55	

Table A.2 Primary Race of the Children in the Samples from The Five P's National Replication Study and the VPSW Validation Study of The Five P's

	National Replication Study Total	National Replication Study % of Total	VPSW Validity Study Total	VPSW Validity Study % of Total
Caucasian	211	57.0	49	89.1
Black	31	8.4	2	3.6
Hispanic	47	12.7	2	3.6
Asian	5	1.4	1	1.8
East Indian	0	0.0	1	1.8
No Data Given	76	20.5	0	0.0
Total	370		55	

Table A.3 Ordinal Position of the Children in Samples from The Five P's National Replication Study and the VPSW Validation Study of The Five P's

	Number of Children at Each Position	
	National Replication Study	VPSW Validation Study
First Child in Family	118 (65)*	23 (15)*
Second Child in Family	95	21
Third Child in Family	41	9
Fourth Child in Family	15	1
Fifth Child in Family	5	1
Sixth Child in Family	1	0
No Data on Child	95	0
Totals	370	55

*First and only child in family.

Table A.4 Marital Status of the Parents in Samples from The Five P's National Replication Study and the VPSW Validation Study of The Five P's

	National Replication Study		VPSW Validation Study	
	Total	% of Total	Total	% of Total
Intact	199	53.8	47	85.5
Divorced	24	6.5	0	0.0
Single Parent	18	4.9	2	3.6
Widowed Parent	2	0.5	0	0.0
Parents Separated	12	3.2	1	1.8
Blended Family	19	5.1	2	3.6
Foster Parents	20	5.4	2	3.6
Adopted Family	0	0.0	1	1.8
Other	6	1.6	0	0.0
No Data Available	70	18.9	0	0.0
Totals	370		55	

Table A.5.a Estimate of Income of Families in The Five P's Replication Study

	# of Families	% of Total
$00 to $9,999	41	11.1
$10,000 to $19,999	69	18.6
$20,000 to $34,999	105	28.4
$35,000 to $49,999	34	9.2
$50,000 Plus	26	7.0
No Data	95	25.7
Totals	370	

Table A.5.b Estimate of Income of Families in the VPSW Validation Studies of The Five P's

	# of Families	% of Total
$00 to $9,999	2	3.6
$10,000 to $19,999	4	7.3
$20,000 to $29,999	9	16.4
$30,000 to $39,999	14	25.5
$40,000 to $49,999	13	23.6
$50,000 Plus	13	23.6
No Data	0	0
Totals	55	

Table A.6 Educational Levels of Mothers and Fathers in The Five P's Replication Study and the VPSW Validation Studies of The Five P's

	National Replication Study		VPSW Validation Study	
	# of Mothers	# of Fathers	# of Mothers	# of Fathers
Grade School	13	8	0	0
Some High School	23	28	2	1
High School Graduate	100	132	17	13
Some College	48	67	15	11
College Graduate	32	35	7	11
Some Graduate Training	4	5	0	1
Graduate Degree	29	16	7	8
No Data	121	79	7	10
Totals	370	370	55	55

Table A.7 Academic Preparation of Teachers in The Five P's Replication Study and The VPSW Validation Studies of The Five P's

Degrees	National Replication Study # of Teachers	VPSW Validation Study # of Teachers
Associate of Arts/Science	15	1
Bachelor of Arts/Sciences	30	2
Masters of Arts/Sciences	14	16
Other Graduate	4	0
Totals	63	19

Table A.8 Years of Experience of Teachers in Present Position in The Five P's Replication Study and The VPSW Validation Studies of The Five P's

	National Replication Study # of Teachers	VPSW Validation Study # of Teachers
Less Than One Year	8	2
One to Three Years	22	8
Four to Six Years	13	8
Seven to Nine Years	7	1
Ten to Twelve Years	6	0
Thirteen or More Years	3	0
No Data	4	0
Totals	63	19

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